

EIS/EIR Executive Summary

Purpose of Study and EIS/EIR

The Sacramento and San Joaquin Delta region provides water to the majority of California's agriculture and to urban and industrial communities. The Delta also provides habitat for numerous plant, animal, and fish species, including several endangered species. This dual role places the Delta region at the center of an ongoing conflict between environmental and water supply interests.

Within the Delta, Federal (Central Valley Project or CVP) and State (State Water Project or SWP)¹ pumping plants move water from the Delta to a system of canals and reservoirs for use by agriculture, communities, and wildlife refuges in the Central Valley, the Bay Area, along the central coast, and southern California. Pumping of water from the Delta alters normal flow patterns and can threaten the recovery of endangered and threatened fish species unless the protection of those species is employed as an operations parameter. Reduction of Delta pumping for protection and recovery of fish can, however, interrupt water supply deliveries. These interruptions reduce the reliability of California's water supply, causing conflicts.

The CALFED Bay-Delta Program (CALFED Program)² is a collaborative effort of 23 Federal and State agencies that seek to resolve these conflicts. The primary goals of the CALFED Program are to restore the ecological health of the Bay-Delta estuary; improve water supply reliability to farms and cities; protect drinking water quality; and protect the integrity of the Delta levees for water conveyance and ecosystem function. The CALFED Programmatic Environmental Impact Statement/Environmental Impact Report (PEIS/EIR) Record of Decision (ROD) and Operating Principles Agreement identified an Environmental Water Account (EWA) as one element of its overall strategy for meeting the goals of the CALFED Program. The CALFED ROD identifies the EWA as a cooperative management program to protect the fish of the Bay-Delta estuary through environmentally beneficial changes in CVP/SWP operations at no uncompensated water cost to the CVP/SWP water users. This document tiers from the CALFED Bay-Delta PEIS/EIR and the CALFED ROD and as such assesses and evaluates alternatives for EWA implementation as introduced in the CALFED ROD. The EWA consists of two primary elements: (1) assisting in fish population recovery for at-risk native fish species; and (2) increasing water supply reliability by reducing uncertainty associated with fish recovery actions.

The CALFED agencies that developed the EWA recognized that to contribute effectively to the CALFED Program and to complement efforts to meet the range of

¹ The California Department of Water Resources (DWR) operates the SWP by storing available water upstream from the Delta and moving it along with unstored natural flows through the Delta to serve agricultural and urban users in the Central Valley, San Francisco Bay Area, central coast, and southern California. Reclamation operates the CVP in the same fashion, providing water to agricultural and urban users in the Central Valley and San Francisco Bay Area.

² The California Bay-Delta Authority, created effectively January 1, 2003, will exercise oversight and coordination over the CALFED Bay-Delta Program.

CALFED ROD objectives, the EWA Program must incorporate a highly flexible, immediately implementable, and reliable water management strategy. The EWA must (1) protect the at-risk fish species affected by SWP/CVP operations and facilities, (2) contribute to the recovery of these species, (3) allow timely water-management responses to changing environmental conditions and changing fish protection needs, (4) provide reliable water supplies to water users in SWP/CVP export areas, and (5) not result in uncompensated water loss to users. This water management strategy also must comply with the general EWA guidance presented in the CALFED ROD and the EWA Operating Principles.

EWA Agencies

Five Federal and State agencies are involved in administering the EWA. The California Department of Water Resources (DWR) and the Bureau of Reclamation (Reclamation), or the “Project Agencies,” are responsible for acquiring water assets and for storing and conveying the assets through use of the SWP and CVP facilities. The “Management Agencies,” which include the State and Federal fishery agencies (National Marine Fishery Service [NOAA Fisheries], U.S. Fish and Wildlife Service [USFWS], and the California Department of Fish and Game [CDFG]), use the EWA to protect and restore fish. All five EWA agencies are responsible for the day-to-day program management of actions taken to protect and benefit fish (e.g., pumping reductions to protect fish) and instream flow enhancements to help facilitate fish population recovery.



Figure ES-1
EWA Study Area

Study Area

The study area for this Environmental Impact Statement/Environmental Impact Report (EIS/EIR) encompasses the areas where the EWA agencies could acquire and manage assets as well as the areas where the assets could be used to benefit fish. Figure ES-1 shows the study area, which includes the entire Central Valley served by the SWP and CVP; the Delta region; coastal areas south of San Francisco served by the SWP; and areas of southern California served by the SWP. The study area also includes reservoirs in the foothills of the central Sierra Nevada. Rivers in the study region for this EIS/EIR include the Sacramento, Feather, Yuba, American, Merced, and San Joaquin.

Development of the EWA Alternatives

The California Environmental Quality Act (CEQA) requires that environmental documents identify and analyze a reasonable range of feasible alternatives that could meet the project purpose and need statement to varying degrees. Under CEQA, the range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. In addition, the National Environmental Policy Act (NEPA) requires that a reasonable range of alternatives be analyzed, including a no action alternative. The development of alternatives presented in this document was an iterative and collaborative process involving representatives from the Reclamation, DWR, USFWS, NOAA Fisheries, and CDFG. These agencies worked together to interpret the CALFED ROD definition of the EWA while considering a range of possible EWA alternatives.

To address the ability of EWA agencies in meeting the goal to provide water for the protection and recovery of fish beyond that available under the regulatory baseline, the CALFED ROD identified the EWA as a 4-year (2001-04) cooperative management program of which the purpose is to provide protection to the fish of the Bay-Delta estuary at no uncompensated water cost to the Project's water users. The approach involves acquiring alternative sources of Project water supplies to replace water supply otherwise lost through changes in Project operations. The EWA agencies may determine through written agreement to extend the EWA beyond September 30, 2004, as stated in the CALFED ROD. Because there is a possibility for extension, this EIS/EIR analyzes EWA actions that will start at the time of the signing of the EWA ROD through 2007. The EWA ROD is scheduled for signing in early 2004.

The EWA's purpose and need and project objectives formed the basis for the identification and evaluation of the range of alternatives. The selection of alternatives for detailed analysis was based on the three primary considerations related to the ongoing water conflict at the Delta pumps; alternatives selected for detailed analysis needed to be immediately implementable, flexible, and reliable.

- **Immediate.** Conflict at the pumps was an ongoing problem that required an immediate solution to meet both water supply needs and environmental protection requirements. Water agencies, water users, and resource agencies could not wait for the construction of new facilities or planned changes in water uses.
- **Flexible.** Any action taken to reduce the pumping conflict would need to take advantage of multiple means of water purchase, storage, and release, using spatial and temporal variation to provide water when it was most needed. Flexible water assets could be acquired from any entity and transferred to any entity connected to the Project systems to prevent interruption of water supplies.
- **Reliable.** Reliability is important for water users. Historic conflicts at the pump created uncertainty for users because fish presence near the export pumps could cause unexpected reductions in pumping, and these reductions could affect water

supply. Alternatives must increase supply reliability for urban, agricultural, and environmental users in the Export Service Area.

The EWA Program takes advantage of the operational flexibility of the SWP and CVP facilities to manage EWA assets to the benefit of the environment and water users.

Alternatives Considered But Eliminated from Further Consideration

The alternatives development team considered a variety of means for water management, including other actions described in the ROD and other ongoing water management programs and projects. The construction of new facilities (e.g., reservoirs) to store additional water during times of pump curtailments was not considered because evaluation, design, permitting, and construction would delay the use of these facilities until after the EWA timeframe. Likewise, modifying pumping facilities to prevent fish entrainment (e.g., with Delta infiltration galleries) would require development of new designs and detailed review by all involved agencies, which could take years before permitting and construction could begin. The EWA development team also considered and rejected the following alternatives:

- **Construction of desalination plants in southern California.** Although such plants have gained acceptance as improved technologies have reduced desalination costs, it would be years before a new plant could come online to provide sufficient water quantities that could offset the water potentially lost during pump curtailments.
- **Increased use of Colorado River water.** To address conflicts regarding Colorado River apportionments, the Department of the Interior (DOI) asked California to reduce its use of Colorado River water. While California users are reducing dependence on Colorado River supplies, water users will likely need all available supplies. Increasing the use of Colorado River water would not provide reliable supplies, nor would the water be available for immediate use, so this alternative was not carried forward as an alternative.
- **Water use efficiency within the project service area.** Improved water use efficiency is a goal of the CALFED Program and is included as one of the program components. However, water efficiency alone would not be sufficient to accomplish the CALFED Program's goals for the EWA during Stage 1.
- **Additional water sources, including new or increased capacity of storage facilities, new conveyance facilities, or "water bladders" to transport water to southern California.** Development of new supplies or supply methods would delay use of these potential alternatives beyond the EWA timeframe. Development of new conveyance facilities (e.g., an isolated facility) would also be beyond the EWA timeframe.

Recognizing the need for an immediate solution to the conflicts between fish protection and water exports, the EWA agencies dismissed these and other

alternatives and focused on the EWA water asset acquisition and management strategy introduced in the CALFED ROD.

EWA Description

As noted above, the EWA, as introduced in the CALFED ROD, consists of two primary elements: facilitation of fish population recovery through asset (water) acquisition and management and use of the acquired assets to replace water deliveries (or supplies) interrupted by changes in project operations. That is, the EWA helps facilitate fish population recovery by reducing pumping in the Delta when fish are most at risk. EWA agencies would also acquire water either for direct environmental use, or to repay SWP and CVP contractors whose supplies would have otherwise been interrupted by actions taken to benefit fish. Asset acquisition is the responsibility of the two Project Agencies, Reclamation and DWR. Actions taken to benefit fish are recommended by the three Management Agencies (NOAA Fisheries, USFWS, and CDFG).

EWA assets are used to replace the water that would have otherwise been delivered to export service area contractors when fish actions are taken to protect and enhance fish species recovery. As noted previously, the EWA Management Agencies are responsible for recommending the timing and location of asset use in fish actions. The fish actions recommended by the EWA Management Agencies include:

- **Pump Reductions** – Decreasing export pumping from the Delta when at risk fish species are determined to be within the vicinity of the SWP and CVP pumping stations.
- **Delta Cross Channel Gates Closure** – Closing the Delta Cross Channel Gates (above the regulatory baseline) to restore natural flow patterns and to encourage fish to migrate through the most suitable water channels away from the SWP and CVP pumping stations.
- **Instream Flow Augmentation** – Increasing the streamflow of rivers tributary to the Delta (through releases of EWA assets stored in onstream reservoirs) to improve spawning, migration, and rearing habitats.
- **Delta Outflow Augmentation** – Increasing the Delta outflow quantity to repel saline San Francisco/San Pablo Bay water from the Delta, to improve the water quality in Delta habitats, and to improve fish outmigration

The asset acquisition measures available to the EWA agencies include:

- **Stored Reservoir Water Purchase** – Purchase of surface water stored in non-Project reservoirs (not CVP or SWP reservoirs).
- **Groundwater Substitution** – Purchase of surface water supplies (typically stored in a reservoir) while the users forego their surface water supplies and pump an equivalent amount of groundwater as an alternative supply.

- **Crop Idling/Crop Shifting** – Purchase of water from agricultural users who then idle land that would otherwise have been in production or shift to less water-intensive crops.
- **Stored Groundwater Purchase** – Purchase of groundwater assets that were previously stored by the selling agency with the intent to sell a portion of those assets at a later date. This option differs from groundwater substitution in that groundwater substitution transfers would not come from water that had been previously stored.
- **Variable Assets** – Obtaining water through a regulatory or operational change in the Delta that allows water to be diverted from the Delta specifically for the EWA.

In addition to managing the acquired water, the EWA agencies may use the following asset management measures:

- **Source Shifting** – Providing water earlier or delaying water deliveries to a Project contractor. Under the earlier delivery, the EWA agencies would be essentially borrowing storage space from the contractors' facilities for a fee until the time the contractor would normally have received the water. Under the delayed delivery the EWA agencies would be essentially borrowing water for a fee and returning the water at a later date.
- **Stored Water** – purchasing stored water from the south-of-Delta sources to be used as collateral for borrowing (released only when all other assets have been expended), and to function as long-term storage space after the water has been released; and.
- **Borrowing Project Water** – Borrowing CVP or SWP water, if the water can be repaid without affecting deliveries to Project contractors. The EWA could also borrow Project storage space if the Projects do not need that space for other designated uses.
- **Exchange of EWA Assets** – If the Management Agencies decide to do so, the Project Agencies may exchange EWA assets for assets of a character, such as location, seasonality or year-type, more suitable to EWA purposes.

The Project Agencies determine the quantity of water that can be made available each year to agricultural and urban contractors within the Export Service Area. The Project Agencies then move that amount of water, either from natural flows within the Sacramento and San Joaquin River Basins or from Project reservoirs upstream from the Delta, through the Delta using the export pumping plants. EWA asset management activities also involve use of the Delta pumps when capacity is available. In wet rainfall years, the Delta pumps export water at nearly 100 percent of their capacity during the summer transfer window, leaving minimal export capacity available for moving EWA assets. Whereas, in dry rainfall years, the export pumps are not running at capacity, leaving more capacity available to move EWA assets than in wet years, during the summer transfer window. During dry years, the EWA

agencies would have fewer requirements to replace water lost during pumping reductions because the pumps would not have been operating at full capacity without the EWA. Therefore the EWA Project Agencies may need to make fewer water acquisitions during dry years.

This variation in the availability of Delta pumping capacity is important to the implementation of the EWA program because it affects how assets could be acquired and managed. In general, acquiring EWA assets from areas upstream from the Delta would be less expensive than acquiring them from sellers in the Export Service Area. Assets purchased in the Export Service Area are often more expensive than other assets because potential sources in the Export Service Area are more limited; water agencies are often paying for storage and conveyance facilities; and growing conditions are more conducive to higher value crops than in the Upstream from the Delta Region.

The strategies that the EWA agencies would employ to acquire and manage assets would also vary by the hydrologic conditions posed during each water year. The approaches to acquire and manage water during hydrologically wet years (years when there is more water in the reservoirs and rivers upstream from the Delta than average) versus hydrologic dry years (less water or drought years) are described below.

- In wet years, EWA agencies would probably acquire some surface water from non-Project reservoirs upstream from the Delta because this water would be readily available and is the least expensive asset source. However, the amount of water EWA agencies would be able to export to service areas south of the Delta would be limited because the CVP/SWP export pumping facilities would be at capacity meeting contract commitments during most of the summer. During wet years, EWA agencies would need to focus on water acquisition via stored groundwater purchase or crop idling within the Export Service Area to address EWA water supply commitment goals. The EWA Project Agencies would not need to move these assets through the Delta.
- In dry years, when less water is available to meet CVP/SWP contract commitments, the Delta pumps would have greater availability to move EWA assets. EWA agencies would focus on acquisitions upstream from the Delta. The EWA would still look to purchase stored reservoir water first because of the lower price, but this water may be less available than in wet years. The EWA agencies would then focus water acquisitions on groundwater substitution and crop idling upstream from the Delta. The EWA agencies could use these upstream from the Delta water acquisitions to produce secondary benefits, such as increased instream flows and Delta outflows.

No Action/No Project Alternative

The No Action/No Project Alternative describes the reasonably foreseeable future without the EWA (if the EWA were not approved) based on legal and regulatory constraints. If the EWA were not implemented, actions to protect fish that are

mandated by existing regulatory requirements would continue. For example, compliance with the biological opinions developed by USFWS and NOAA Fisheries under the Endangered Species Act would require pumping reductions, resulting in reduced deliveries. DWR and Reclamation would continue to reoperate the SWP and CVP, respectively, to avoid decreased deliveries to export users, but would not acquire and manage EWA assets that could be used to repay lost deliveries.

In response to decreased water supply reliability, some agricultural water contractors would either accept the shortage, idle or retire some crop land, substitute crops that use less water, increase the use of local water supplies through groundwater pumping, local transfers, recycling, desalination, or implement additional water use efficiency or conservation. Local entities could also pursue independent water transfers, pursue other non-local sources (e.g., the Colorado River), or turn to litigation and/or political pressure to change rules that result in the reduction of the water supply. Of these potential responses, groundwater pumping is the most likely and the most problematic. Some portions of the San Joaquin Valley groundwater basins are in overdraft, and groundwater in some areas is of lower quality than the surface water supply. Uncompensated Delta pump reductions raise concerns for diminished groundwater supplies and conditions for the San Joaquin Valley.

Urban water contractors could respond to reduced water supply by increasing their emphasis on local water conservation or by relying more heavily on local groundwater and surface water supplies, if they are available. The reduced water supply reliability caused by the pump reductions would make local planning efforts more difficult for the urban water agencies, especially in areas where local supplies are limited.

Flexible Purchase Alternative (The Proposed Action/The Proposed Project)

The Flexible Purchase Alternative uses a flexible interpretation of the CALFED ROD and Operating Principles Agreement, incorporating functionally equivalent purchases and actions within the framework of the ROD. Under the Flexible Purchase Alternative, the EWA agencies would make purchases to provide a higher level of fish protection and recovery than the Fixed Purchase Alternative. The increased level of protection would respond to differing hydrologic conditions and would take advantage of water acquisition/storage possibilities throughout the CVP/SWP service areas.

The Flexible Purchase Alternative would allow the EWA agencies to purchase up to 600,000 acre-feet of water but would not restrict acquisition of the total quantities from each region. The EWA agencies could apply the concept of functional equivalency by combining acquisition methods, water sources, and operational flexibilities to effectively respond to annual changes in hydrology and fish behavior in the Delta. Under the Flexible Purchase Alternative, the EWA agencies would acquire variable assets in the same manner as for the Fixed Purchase Alternative.

Allowing flexibility to acquire and manage EWA assets differently each year could increase the EWA agencies' capability for responding to varying hydrologic conditions. During dry years when greater export pump capacity is available, the agencies could acquire quantities up to that capacity (potentially up to 500,000 acre-feet) upstream from the Delta for storage, pre-delivery, or delayed delivery within the Export Service Area. The Flexible Purchase alternative would allow the EWA agencies to respond to changes in existing operations and allow for additional upstream fish actions, such as instream flow enhancements.

Under the Flexible Purchase Alternative, the Project Agencies would acquire water via stored reservoir water, groundwater substitution, groundwater purchase, or crop idling in a manner and in amounts that would not affect the environment or water supplies adversely. The EWA agencies would employ conservation and mitigation measures, as described in this EIS/EIR, to minimize effects of this alternative.

Fixed Purchase Alternative

The CALFED ROD established the types of EWA acquisition and management actions and included targets for the quantity of assets that the EWA agencies could acquire in each region (Table ES-1). The Fixed Purchase Alternative is based upon a strict interpretation of the ROD. Under this alternative, the Project Agencies would acquire 185,000 acre-feet of EWA assets annually. The Fixed Purchase Alternative includes a target of 35,000 acre-feet for total upstream from the Delta purchases and 150,000 acre-feet for total purchases in the Export Service Area. By dictating the selling region and the maximum purchase amounts, these targets provide for the maximum level of asset acquisitions and resulting types of actions that the Project and Management Agencies can take.

Table ES-1 lists the ROD-specified asset quantities around which the Fixed Purchase Alternative was developed. As the table shows, this alternative also allows for other actions, including source shifting and the acquisition of storage.

Table ES-1 Fixed Purchase Alternative - EWA Tier 2 Assets in Accordance with CALFED ROD⁽¹⁾	
Action Description	Water Available Annually (Average)
SWP Pumping of (b)(2)/ ERP Upstream Releases	40,000 acre-feet
Export/Inflow Ratio Flexibility	30,000 acre-feet
Purchases – Export Service Area	150,000 acre-feet
Purchases – Upstream from the Delta	35,000 acre-feet
Storage acquisition	200,000 acre-feet of storage
Source Shifting Agreement ⁽²⁾	100,000 acre-feet

⁽¹⁾ The water amounts in the ROD were targets for the first year; higher amounts were anticipated for subsequent years.

⁽²⁾ The source shift value reflects the quantity of water that is borrowed and must be returned.

In the region upstream from the Delta under the Fixed Purchase Alternative, the Project Agencies would probably seek first to acquire stored reservoir water, which represents the least expensive asset. A number of potential surface water sources would likely be available for purchases to comprise 35,000 acre-feet. The Project Agencies would be less likely to acquire water upstream from the Delta via groundwater substitution, stored groundwater purchase, and crop idling. Stored groundwater purchase and crop idling would be the Project Agencies' likely acquisition sources in the Export Service Area.

Because the Fixed Purchase Alternative sets the maximum targets for the quantity of water that could be acquired, actions taken by the EWA agencies would be limited to the availability of carryover assets from prior years, assets available from Delta flexibility (variable assets), purchases of 185,000 acre-feet, source shifting, and the capacity to borrow water from the projects based on the availability of groundwater storage. The Fixed Purchase Alternative would provide some water management flexibility over the No Action/No Project Alternative and would address at least a portion of the water reliability concerns caused by export pump reductions.

Comparison of Alternatives

Table ES-2 presents a comparison of the EWA asset acquisition and strategies for the project alternatives. Two important interrelated considerations regarding EWA asset purchase strategies are the hydrologic-year type and the excess Delta pump capacity available to export EWA assets. The hydrologic-year type has a strong influence on the availability of Delta pumping capacity for the EWA.

As explained previously, during wet years the CVP and SWP have more water available for Project contractors and must move this water from upstream from the Delta, through the Delta pumps, and to the Project contractors in the Export Service Area. In wet years, the Delta pumps have less capacity available to move EWA assets into the Export Service Area due to the CVP and SWP necessity to meet contract commitments.

Under the Fixed Purchase Alternative, during wet years, the EWA Project Agencies would acquire 35,000 acre-feet of assets upstream from the Delta. The Flexible Purchase Alternative would not cap upstream from the Delta acquisitions, but Delta pumping capacity would likely limit the amount of acquisitions to 75,000 acre-feet. Of the 75,000 acre-feet acquired, about 15,000 acre-feet becomes Delta outflow as carriage water losses and the remaining 60,000 acre-feet would be transferred south of the Delta using the EWA's dedicated 500 cubic feet per second (cfs) transfer capacity during the July through September transfer period. The 75,000 wet year limit for the Flexible Purchase Alternative would be an amount similar to that under the Fixed Purchase Alternative for all water year types.

Table ES-2
Comparison of EWA Alternatives

EWA Water Acquisition	No Action/No Project	Flexible Purchase Alternative	Fixed Purchase Alternative
Fish Actions			
Operational Curtailments (pumping reductions to increase Delta outflow)	Actions address ESA ⁽³⁾ Biological Opinions only; no ability to repay water not delivered due to pump curtailments	Ability to provide fish protection actions at Delta pumps beyond ESA, but limited to the total volume of water acquired, variable assets, and debt without interrupting water supply. Availability of 600 TAF ⁽¹⁾ of water increases opportunity for fish actions and ability to repay Projects for water not delivered during pump curtailments.	Ability to provide fish protection actions at Delta pumps beyond ESA, but limited to total volume of water acquired, variable assets, and debt without interrupting water supply. Availability of 185 TAF of water increases opportunity for fish actions and ability to repay Projects for water not delivered during pump curtailments.
Upstream Flow Enhancements for Fish Recovery/Enhancements	No potential for upstream flow enhancements beyond existing programs	The magnitude of potential benefits would vary between rivers but would be limited by the volume of upstream purchases moved during the transfer window, which could be up to 600,000 acre-feet.	The magnitude of potential benefits would vary between rivers but would be limited by the volume of upstream purchases moved during the transfer window, which could be up to 35,000 acre-feet.
Ability to Purchase Additional Water to Account for (b)(2) Changes	No ability	Acquisition of 600 TAF increases potential to acquire additional water to address the (b)(2) changes.	Acquisition of 35 TAF increases potential to acquire additional water to address the (b)(2) changes.
Asset Acquisition			
Stored Reservoir Purchase	No purchases	Purchases of up to 135 TAF in dry years; wet year purchases would be limited to the Delta ⁽²⁾ pump capacity available to EWA of up to 50 TAF	Limited to 35 TAF Upstream from the Delta
Groundwater Substitution	No purchases	Purchases of up to 315 TAF in dry years, but only up to 50 TAF in wet years; groundwater substitution would most likely be exercised in dry years but not in wet years due to pump capacity	Limited to 35 TAF Upstream from the Delta; probably would not be exercised in most years because 35 TAF can be obtained from stored water sources
Groundwater Purchase (Upstream from the Delta)	No purchases	Purchases of up to 35 TAF in dry and wet years; wet year purchase quantity would be dependent on amount acquired via other strategies.	Limited to 35 TAF Upstream from the Delta; probably would not be exercised in most years because 35 TAF can be obtained from stored water sources
Groundwater Purchase (Export Service Area)	No purchases	150 TAF maximum; stored groundwater purchase would not be available each year	Purchase of up to 150 TAF maximum; stored groundwater purchase would not be available each year
Crop Idling (rice Upstream from the Delta);	No purchases	Purchases of up to 180 TAF in dry years and 50 TAF in wet years. Crop idling would probably not be exercised in wet years.	Limited to 35 TAF Upstream from the Delta; probably would not be exercised in most years because 35 TAF can be obtained from stored water sources
Crop Idling (cotton within export service area)	No purchases	Purchases of up to 375 TAF; higher amounts would be expected for wet years when EWA has less pump capacity to export water from Delta	Purchase of up to 150 TAF maximum within export service area; higher purchases would be expected in wet years due to Delta pump capacity limitations
Variable Assets	Variable Assets defined in CALFED ROD not available for fishery actions under No Action	Variable amounts of water available to EWA each year through changes in Delta operations.	Same as Flexible Purchase Alternative
Asset Management Activities			
Groundwater Storage (banking)	No storage	Up to 200 TAF	200 TAF addressing CALFED ROD first year EWA requirement
Source Shifting	No source shifting to protect San Luis Reservoir from low-point water quality impacts	Source shifting to protect San Luis is available	Source shifting to protect San Luis is available
Project Water Borrowing	No project borrowing to repay water not delivered due to pump curtailments water	Potential for borrowing water for later repayment of up to 100 TAF	Potential for borrowing water for later repayment of up to 100 TAF
Ability to Purchase Additional Water to Account for (b)(2) Changes	No ability beyond existing program	Greater potential to acquire additional water to address the (b)(2) changes	Depending on water year and fish behavior at the pumps, there may be a potential for limited amounts of additional water being available to address the (b)(2) changes

(1) TAF = thousand acre feet

(2) Hydrologic modeling of Delta pump capacity indicates that there would be 50 TAF of excess capacity available to EWA during wet years and up to 520 TAF in dry years. Delta pump capacity is a limiting factor on the quantity of water EWA agencies can purchase and export to the CVP/SWP service areas.

(3) Federal Endangered Species Act

In the Export Service Area, the Project Agencies would focus on acquisitions of assets through crop idling (cotton) and stored groundwater purchase. The Fixed Purchase Alternative would target these purchases at 150,000 acre-feet. Under the Flexible Purchase Alternative, acquisitions would be limited by EWA funding or the amount of water offered by the willing sellers. During wet years under the Flexible Purchase Alternative, approximately 540,000 acre-feet purchased within the Export Service Area and 60,000 acre-feet upstream from the Delta are analyzed in this EIS/EIR.

Because of its wider potential range of purchases and actions, the Flexible Purchase Alternative would have a greater potential for environmental, physical, and socioeconomic effects in wet years than the Fixed Purchase Alternative. However, the Management Agencies would have greater potential for operational changes that benefit fish while keeping the Project contractors whole (provide for replacement water), plus greater opportunities for Delta outflow benefits and for upstream flow enhancements. During dry years, less water would be available for the Projects to export to Project contractors, and the Delta pumps would have more pumping capacity available for EWA use than in wet years.

Upstream from the Delta, the Fixed Purchase Alternative's 35,000 acre-foot target would limit acquisitions to a quantity range likely to be available from the least expensive source – stored reservoir water. The 150,000 acre-feet purchased in the Export Service Area would likely come from crop idling, assuming that groundwater purchases would not be possible in some years. Under the Flexible Purchase Alternative, in which the acquisition limitation is effectively the Delta pump availability, asset acquisitions upstream from the Delta would focus on purchase of stored reservoir water first, followed by groundwater substitution, groundwater purchase, and finally rice cropland idling. The Project Agencies would be likely to focus acquisition efforts for the Flexible Purchase Alternative on the less expensive, upstream-from-the-Delta sources and may not need to make purchases within the Export Service Area.

Although both the Fixed Purchase and Flexible Purchase alternatives could achieve similar benefits, the Flexible Purchase Alternative would have a greater potential to achieve fishery protection, enhancement, and recovery goals than the Fixed Purchase Alternative. The behavior of fish at the Delta pumps – the timing of their arrival (typically winter and spring; December through June) and the length of their stay – varies year-to-year and cannot be predicted in advance. Years in which the fish arrive late and leave early may require fewer pump reductions than other years and the Fixed Purchase Alternative may have adequate assets to cover those reductions as well as providing water for upstream fish enhancements.

In years in which the fish arrive early and leave later, pump reductions may occur more often, resulting in the potential for insufficient assets to address Project water commitments under the Fixed Purchase Alternative. In such years, the Flexible Purchase Alternative would have a greater potential for meeting both the Project water commitments and the fish enhancement benefits intended for EWA under the CALFED ROD.

Environmental Consequences

The environmental baseline used to establish the basis for determining effects of EWA actions is derived from the CEQA definition of existing conditions and the NEPA definition of future conditions without project. The reader is referred to the individual resource chapters in this EIS/EIR for discussions on how the baseline is being applied to each resource.

Table ES-3 presents a summary of how EWA asset acquisition and management actions could effect the natural, physical, and social environments. The table describes the effect and provides the determination of whether the effect is potentially significant or less than significant.

Table ES-4 presents the proposed mitigation measures that will reduce the potential effect to less than significant. Chapter 2 presents additional details on the mitigation measures.

Table ES-5 summarizes the benefits of EWA asset acquisition and management actions for each of the alternatives.

Compliance With Applicable Laws and Regulations

This EIS/EIR complies with NEPA and CEQA requirements. The Proposed Project, as defined herein, would comply with all Federal, State, and local laws and permitting requirements.

Major Conclusions and Findings

This EIS/EIR addresses the effects of water asset acquisition and management in relation to providing environmentally beneficial changes to CVP/SWP operations that protect at risk fish species in the Delta and increase water supply reliability to CVP/SWP water users. The environmental analyses of the proposed EWA project support the decision of the CALFED Programmatic ROD for the EWA program strategy. The analyses demonstrate that the EWA water management measures would provide benefits towards achieving population recovery for at-risk fish species in the Delta (fewer fish losses at the Delta pumps) and there will be no uncompensated water costs to Project water users.

DWR initiated acquisition of EWA assets during 2000-01, and Reclamation along with DWR purchased assets the following years. Because the ROD and EWA Operating Principles Agreement allowed for achievement of the goals through the use of functional equivalent methods for water acquisition and management, the Project and Management Agencies were able to meet the CALFED ROD goals of EWA during the first 3 years. While environmental compliance for the initial asset acquisitions was based on 1-year documents, future acquisitions will be based on the analyses and acquisition strategies provided in this EIS/EIR. This document will be supplemented if necessary to complete future acquisitions not addressed herein.

This EIS/EIR addresses the environmental effects of EWA water asset acquisition through stored reservoir water purchase, groundwater substitution, crop idling, and stored groundwater purchase, and management of those assets through reservoir releases, borrowing of Project water, groundwater storage services, exchanges, and source shifting. The following text summarizes the EWA effects by resource category.

Surface Water Supply and Management

Asset acquisition through stored reservoir water purchase could affect the water supplies of local water users. The Project Agencies would acquire stored reservoir water only from non-Project reservoirs and only when the reservoir operators have addressed refill criteria. It is anticipated that water agencies would calculate the amount of carryover storage that could be released without adverse effects, factoring the potential for a dry year and less refill into the decision-making process.

Willing sellers participating in crop idling would reduce consumptive use of the water. Farmers and other water users not participating in the EWA could receive less water because of reduced tailwater supplies. The willing seller of water from crop idling would maintain return flows in their system to a level that would not harm downstream users.

Increased Delta export pumping could reduce south Delta water levels by less than one inch, potentially affecting irrigation supplies. If EWA pumping decreases south Delta water levels, the EWA will pay its share for additional actions needed to mitigate any impacts to irrigation water supplies.

EWA-related source shift actions would change the timing of deliveries to those water contractors entering into source-shift agreements with the EWA agencies. Source shifting would only occur if the water agency has other water supplies and therefore source shifting would not adversely affect the agency's water supply overall.

Water Quality

Stored groundwater purchase, borrowing project water, and source shifting would have the potential to reduce water quality. With groundwater purchases, the extracted groundwater released into the California Aqueduct must meet DWR's policy for acceptance of non-Project water.

The EWA would change the timing of flows in the Delta. Delta export pump reductions from December through June would increase Delta outflows. EWA fish actions would shift exports from the spring to the summer or early fall, potentially reducing outflows during the summer and fall. The EWA agencies would incorporate carriage water as part of transfers from the Upstream from the Delta Region to maintain water quality in the Delta at pre-EWA levels. EWA actions would decrease total chloride, bromide, and organic carbon load delivered to the CVP and SWP water users.

Groundwater Resources

Groundwater substitution, stored groundwater purchase, and groundwater storage could affect groundwater resources in the Sacramento and San Joaquin Valleys. Potential effects that could be caused by an increase in groundwater extraction include decline in groundwater levels in excess of seasonal fluctuations, interaction with surface water causing reduced flows, an increase in potential for surface subsidence, and negative impacts to groundwater quality. Adherence to groundwater mitigation measures that consist of a well review, pre-purchase groundwater evaluation, and groundwater monitoring and mitigation programs would prevent or mitigate local groundwater supply effects caused by groundwater substitution and storage.

Geology, Soils, and Seismicity

Idling of cotton crops within the Export Service Area has the potential to contribute to windborne soil loss from the idled fields. Completion of a dust suppression plan as required by the San Joaquin Valley Air Pollution Control District would limit soil erosion.

Air Quality

Groundwater substitution and stored groundwater purchase would increase use of groundwater pumps. Increased pumping using diesel engines would produce NO_x and PM₁₀ emissions in nonattainment areas. The addition of project-related emissions in a nonattainment area is a significant impact. Mitigation measures including use of electric pumps would reduce project-related emissions to a less-than-significant level.

Idling cotton crops within the Export Service Area has the potential to contribute to the production of windborne dust and PM₁₀ in an area that is already in nonattainment for total suspended particulate matter. As a mitigation measure, farms that provide water to the EWA would be required to have a dust suppression plan. The plan would describe measures to control dust such as the growing of a cover crop (e.g., winter wheat).

Fisheries and Aquatic Ecosystems

Modeling of EWA assets exported from the Delta demonstrated that reductions in export pumping would benefit at-risk, native fish populations within the Delta. At times exporting water through the Delta could harm other fish species, but overall benefits to at-risk species outweigh the harm to non-native species.

Vegetation and Wildlife

Management of EWA assets such as holding back water in reservoirs or releasing water later than usual would change the timing and amount of river flows. Riparian vegetation is dependent upon the hydrologic and geomorphic processes that rivers provide. Alterations of these processes can affect germination, growth, and succession. The EWA agencies will implement a monitoring program to ensure that EWA actions will not exacerbate adverse effects already induced by the building of dams and levees, mining, logging, etc.

Groundwater substitution, crop idling, stored reservoir water purchase, and source shifting/pre-delivery would change water surface elevations of the various reservoirs and lakes in the EWA area of analysis, either raising or lowering lake levels depending upon the action. Altering lake levels would inundate or expose shoreline areas on a more frequent basis than without the EWA program; however, these areas are typically devoid of all but ruderal vegetation. Therefore, riparian, lacustrine, and other habitats and associated wildlife would not be affected by EWA actions.

Idling of rice crops upstream from the Delta has the potential to reduce agriculture return flows. The loss of these return flows may reduce water supplies for wetlands dependent upon agriculture return flows as a water source. The EWA agencies will require the willing seller of water for crop idling to maintain their drainage systems at a water level that would maintain existing wetlands providing habitat to covered species to ensure that effects are less than significant.

Groundwater substitution actions have the potential to affect vegetation by reducing water supplied by groundwater-surface water interactions. Effects to wetlands and other habitats potentially affected by groundwater substitution actions will be taken into account as part of the well adequacy review and monitoring program for groundwater supplies.

Idling rice crops upstream from the Delta has the potential to reduce aquatic habitat for the endangered giant garter snake. EWA Agencies would employ a water acquisition strategy that would avoid rice crop idling in areas considered as core habitat by USFWS. As part of water acquisitions from willing sellers, the Project Agencies would require the maintenance of habitat contained in agricultural ditches and the separation of idling locations into distinct units such that habitat is not fragmented and migration routes are not interrupted. Idling of rice land would reduce winter forage for some migratory bird species. Analysis of population trends for migratory birds indicates that they are not forage limited and that idling may change distribution patterns but not adversely affect the species.

Regional and Agricultural Economics

Crop idling (rice upstream from the Delta and cotton within the Export Service Area) would have the potential to affect the regional and agricultural economy in the selected counties. The Project Agencies would limit EWA water acquisitions available from crop idling to less than 20 percent of rice or cotton acreage within a county to reduce third party effects. The Project Agencies would not acquire water through idling in areas that have higher-than-normal idling rates including areas with accelerated or proposed land retirement programs. To prevent cumulative effects, EWA agencies would consider other reasonable and foreseeable crop idling transfers before idling up to 20 percent of the county crop acreage.

Agricultural Land Use

Crop idling (rice upstream from the Delta and cotton in the Export Service Area) would have the potential to change current land use patterns. EWA water acquisitions from crop idling would result in temporary changes to land use. Landowners could

resume planting in the subsequent season after the water transfer. EWA water acquisition would not result in the permanent conversion of any agricultural land.

Agricultural Social Issues

The two crops identified for crop idling water acquisition actions, rice and cotton, were chosen because they provide greater amounts of water per acre of land idled and typically involve fewer farm workers than other crops. This maximized the water purchasing ability of the EWA agencies and at the same time minimized unemployment effects. These two considerations, coupled with limiting crop idling to less than 20 percent of cropland in each county, resulted in the determination that the effect on agricultural social issues would be within the labor fluctuations of each county.

Recreation Resources

The acquisition of stored reservoir water from non-Project reservoirs has the potential to decrease reservoir surface levels earlier in the recreation season compared to the Baseline Condition. However, this decrease would not significantly affect the ability of the public to access or use the reservoirs. EWA management of assets through source shifting at Lake Perris and Castaic Lake would cause reservoirs to fluctuate within recent operating parameters; however, the fluctuations could occur more often with EWA actions. This is a potentially significant impact. Implementation of mitigation measures would reduce it to less than significant.

Flood Control

Purchases and storage of EWA assets in reservoirs managed for flood control would not affect the flood control capacity of those reservoirs. Storage of EWA water has lower priority than flood control requirements, and the Project Agencies would either transfer EWA assets or lose them through spillage when reservoir operators decrease reservoir levels in anticipation of the upcoming winter rainfall season. EWA actions that decrease reservoir surface water elevation during the flood season could provide potentially beneficial effects on flood control.

Power Production and Use

Storage and releases of water from Project CVP/SWP reservoirs could affect the timing of power production from the facilities and use of power at Project CVP/SWP facilities. In accordance with the CALFED ROD, the EWA would be required to compensate the Projects for any net costs related to power caused by management of EWA assets.

Cultural Resources

Surface water acquisitions from non-Project reservoirs would have the potential to expose cultural resources that would normally be inundated by reservoir water. Project Agencies would consult with the State Historic Preservation Office and the U.S. Forest Service to address this effect should it be determined that the surface water purchase would expose cultural resources.

Visual Resources

Surface water acquisitions from non-Project reservoirs could expose the unvegetated drawdown zone surrounding the reservoir either earlier in the season or for a greater area than under non-EWA conditions. The drawdown zone visual effect is a normal phenomenon for water storage reservoirs.

Environmental Justice

Environmental justice focuses on the issue of whether an action would have a disproportional affect a minority or low-income populations. The two crops identified for crop idling water acquisition actions, rice and cotton, were chosen because they provide greater amounts of water per acre of land idled and typically involve fewer farm workers than other crops. In addition, the analysis of employment effects shows that the job losses would be spread throughout the agricultural community and not focused on any particular element of the community.

Indian Trust Assets

Groundwater extraction via groundwater substitution actions near Indian Trust Assets (ITAs) would have the potential to lower groundwater levels beneath the ITAs, potentially affecting water supplies and tribal water rights. Water transfers potentially affecting ITAs will result in the requirement for EWA agencies to consult with the associated Tribes to determine the necessity for mitigation measures.

Identification of Environmentally Preferred Alternative

Although the Fixed Purchase and Flexible Purchase alternatives involve similar water acquisition and management actions, their primary delineator is the magnitude of benefits that each alternative could provide for protecting at-risk fish species and at the same time addressing water supply commitments of the CVP and SWP. The Flexible Alternative would include higher levels of asset acquisition, which would allow the EWA agencies to take more actions to benefit fish. The Fixed Purchase Alternative would limit assets requiring the Management Agencies to prioritize their actions to address pump reductions only. The Flexible Purchase Alternative is the environmentally preferred alternative because of the increased benefits it would provide.

Table ES-3
Summary Comparison of Effects of EWA Alternatives

Resources	Area of Analysis	Potential Effects	Effects Determination			Mitigation
			No Action/ No Project Alternative	Flexible Purchase Alternative	Fixed Purchase Alternative	
Water Supply and Management	Upstream from the Delta Region Rivers ¹	Change in the rate and timing of river flows affecting water supply of Project and non-Project users	No effect	No effect	No effect	None
	Project and Non-Project Reservoirs ²	Reduction in carry-over storage.	No effect	LTS ⁵	LTS	None
	Sacramento-San Joaquin Delta	Change in the rate and timing of Delta inflows and the amount and timing of diversions at the SWP and CVP pumps lowering South Delta water levels	No effect	PS ⁷ , prior to mitigation	PS, prior to mitigation	Yes, see Table ES-4
		Change in available Banks pump capacity for the CVP (Joint Point of Diversion)	No effect	Lost Opportunity	No effect	None
	Export Service Area	Change in the rate and timing of Delta exports for Export Service Area water users	No effect	LTS	LTS	None
		Increase in water supply reliability to SWP and CVP contractors.	No effect	Beneficial effect	Beneficial effect	None
	Export Service Area Reservoirs ³	Change in the pattern of reservoir level fluctuations	No effect	LTS	LTS	None
	Counties with Crop Idling ⁴	Reduction in return flows from fields to agricultural and other water users not participating in EWA	No effect	PS, prior to mitigation	PS, prior to mitigation	Yes, see Table ES-4
Water Quality	Upstream from the Delta Region Rivers	Change in the rate and timing of river flows increasing concentrations of water quality constituents	No effect	LTS	LTS	None
		Increase in river water temperature degrading water quality	No effect	LTS	LTS	None
	Project and Non-Project Reservoirs	Decrease in reservoir water surface elevation increasing concentrations of constituents and degrading water quality	No effect	LTS	LTS	None
	Sacramento-San Joaquin Delta	Increase in chloride, bromide or organic carbon concentrations in the Delta during months of increased pumping	No effect	LTS	LTS	None
		Increase in annual total salt and organic carbon load delivered to CVP and SWP water users.	No effect	LTS	LTS	None

Table ES-3
Summary Comparison of Effects of EWA Alternatives

Resources	Area of Analysis	Potential Effects	Effects Determination			Mitigation
			No Action/ No Project Alternative	Flexible Purchase Alternative	Fixed Purchase Alternative	
Water Quality (continued)	Export Service Area	Decrease in reservoir water surface elevation increasing concentrations of constituents and degrading water quality	No effect	LTS	LTS	None
	California Aqueduct	Exceedance of non-Project water acceptance criteria from release of extracted groundwater into California Aqueduct	No effect	LTS	LTS	None
	Counties with crop idling	Change in timing and quantity of water applied to cropland	No effect	LTS	LTS	None
		Increase in sediment transport via wind erosion and runoff	No effect	LTS	LTS	None
		Change in quality of surface water following mixing of groundwater and surface water	No effect	LTS	LTS	None
Groundwater Resources	Groundwater Basins	Reductions in groundwater levels in excess of seasonal variations	No effect	PS, before mitigation	PS, before mitigation	Yes, see Table ES-4
		Reductions of flows neighboring surface water channels	No effect	PS, before mitigation	PS, before mitigation	Yes, see Table ES-4
		Increased potential for land subsidence	No effect	LTS	LTS	None
		Degradation of groundwater quality	No effect	LTS	LTS	None
Geology, Soils, and Seismicity	Butte, Colusa, Glenn, Placer, Sutter and Yolo Counties	Increase in soil erosion from idled fields	No effect	LTS	LTS	None
	Fresno, Kern, Kings, and Tulare Counties	Increase in soil erosion from idled fields	No effect	PS, prior to mitigation	PS, prior to mitigation	Yes, see Table ES-4
Air Quality	Sacramento, Yolo, Sutter, Merced, Butte, Shasta, Colusa, Glenn, and Yuba Counties	Increase of emissions from use of groundwater pumps	No effect	PS, prior to mitigation	PS, prior to mitigation	Yes, see Table ES-4
	Butte, Colusa, Glenn, Placer, Sutter and Yolo Counties	Increase of fugitive dust and PM ₁₀ emissions from idled fields	No effect	LTS	LTS	None
	Fresno, Kern, Kings, and Tulare Counties	Increase of fugitive dust and PM ₁₀ emissions from idled fields	No effect	PS, prior to mitigation	PS, prior to mitigation	Yes, see Table ES-4

Table ES-3
Summary Comparison of Effects of EWA Alternatives

Resources	Area of Analysis	Potential Effects	Effects Determination			Mitigation
			No Action/ No Project Alternative	Flexible Purchase Alternative	Fixed Purchase Alternative	
Fisheries and Aquatic Ecosystems	Project and Non-Project Reservoirs	Reduction in acreage of littoral habitat available for spawning and rearing	No effect	LTS	LTS	None
		Increase in the frequency of potential nest-dewatering events	No effect	LTS	LTS	None
		Reduction of coldwater habitat availability	No effect	LTS	LTS	None
	Upstream from the Delta Region Rivers	Change in the rate and timing of river flows affecting spawning, rearing and migration of anadromous fish species	No effect	LTS	LTS	None
		Increase in river water temperature affecting spawning, rearing and migration of anadromous fish species	No effect	LTS	LTS	None
		Change in the rate and timing of river flows affecting spawning habitat for resident fish species	No effect	LTS	LTS	None
		Increase in river water temperature affecting spawning habitat for resident fish species	No effect	LTS	LTS	None
		Increase in salmon mortality	No effect	LTS	LTS	None
		Decrease in agricultural return flows to effect spawning, rearing and migration of fish species	No effect	LTS	LTS	None
		Change in water temperature affecting long-term population of coldwater fish	No effect	LTS	LTS	None
	Butte Creek	Decrease in agricultural return flows to effect spawning, rearing and migration of fish species	No effect	LTS	LTS	None
	Lake Natoma	Change in water temperature affecting long-term population of coldwater fish	No effect	LTS	LTS	None
	Nimbus Fish Hatchery	Increase in water temperature affecting hatchery production	No effect	LTS	LTS	None
	Delta	Reductions in reverse flows increasing survival of planktonic fish eggs and larvae and benefiting downstream migrating juvenile Chinook salmon smolts.	No effect	Beneficial effect	Beneficial effect	None
		Change in Delta outflow and location of X ₂ affecting Delta fishery resources	No effect	LTS	LTS	None
		Exceedance of maximum Export: Import ratio identified in the SWRCB Interim Water Quality Control Plan	No effect	LTS	LTS	None
		Increase in reverse flow to delay downstream transport of planktonic eggs and larvae or effect juvenile salmonid emigration	No effect	LTS	LTS	None
		Increase in annual CVP/SWP salvage estimates for Chinook salmon, steelhead, delta smelt, and Sacramento splittail.	No effect	LTS	LTS	None
		Increase in annual CVP/SWP salvage estimates for striped bass	No effect	LTS	LTS	None
		Increase in reservoir drawdown to reduce the availability of habitat for warmwater and coldwater fish species	No effect	LTS	LTS	None
	Export Service Area	Increase in reservoir drawdown to reduce the availability of habitat for warmwater and coldwater fish species	No effect	LTS	LTS	None

Table ES-3
Summary Comparison of Effects of EWA Alternatives

Resources	Area of Analysis	Potential Effects	Effects Determination			Mitigation
			No Action/ No Project Alternative	Flexible Purchase Alternative	Fixed Purchase Alternative	
Vegetation and Wildlife	Upstream from the Delta Region Rivers	Changes in rate and timing of river flows affecting riparian, riverine and associated wetland communities	No effect	LTS	LTS	None
	Project and Non-Project Reservoirs	Decrease in surface water elevation affecting lacustrine and associated upland habitats.	No effect	LTS	LTS	None
	Counties with Crop Idling	Decrease in available seasonally flooded agriculture and associated habitats affecting wildlife and special status species	No effect	LTS ³	LTS	None
		Decrease in seasonally flooded agriculture wastegrain forage affecting wildlife and special status species	No effect	LTS	LTS	None
		Decrease in return agricultural flows affecting wetlands	No effect	LTS	LTS	None
	Sacramento-San Joaquin Delta	Change in Delta parameters affecting riverine aquatic, riparian, and associated wetland habitats	No effect	LTS	LTS	None
	Groundwater Basins	Decrease in water table levels affecting wetlands and riparian habitats	No effect	LTS	LTS	None
	Export Service Area	Decrease in surface water elevation affecting lacustrine and associated uplands	No effect	LTS	LTS	None
Regional and Agricultural Economics	Counties with Crop Idling	Increase net revenue to farmers/land owners participating in the sale of water to EWA	No effect	Economic effect	Economic effect	None
		Decrease in net revenues to tenant farmers	No effect	Economic effect	Economic effect	None
		Temporary reduction in economic activity indicated by rice and cotton acreage, county output, value added, wages and salaries and employment	No effect	Economic effect	Economic effect	None
		Change in county revenue from sales tax, property taxes and subvention payments	No effect	Economic effect	Economic effect	None
	Groundwater Basins	Increase in groundwater extraction costs	No effect	Economic effect	Economic effect	None
	All EWA Regions	Increase in water transfers market prices	No effect	Economic effect	Economic effect	None
Agricultural Social Issues	Counties with Crop Idling	Temporary decrease in farmworker employment	No effect	Economic effect	Economic effect	None
Agricultural Land Use	Counties with Crop Idling	Temporary decrease in the amount of land categorized as prime, statewide importance or unique farmland	LTS	PS, prior to mitigation	PS, prior to mitigation	Yes, see Table ES-4
		Convert lands under the Williamson Act and other land resource protection programs to incompatible uses	LTS	LTS	LTS	None
Recreation Resources	Upstream from the Delta Region Rivers	Change in river flows affecting fishing, hunting and recreation opportunities	No effect	LTS	LTS	None

³ Conservation measures have been developed during informal consultation with USFWS and CDFG and proposed as a part of the Action Specific Implementation Plan (Appendix J) to avoid or minimize effects on the giant garter snake, black tern, greater sandhill crane, and western pond turtle. These measures have been incorporated into the project description of the EWA EIS/EIR.

Table ES-3
Summary Comparison of Effects of EWA Alternatives

Resources	Area of Analysis	Potential Effects	Effects Determination			Mitigation
			No Action/ No Project Alternative	Flexible Purchase Alternative	Fixed Purchase Alternative	
	Project and Non-Project Reservoirs	Change in reservoir water surface elevation affecting fishing, hunting and recreation opportunities	No effect	LTS	LTS	None
	Butte, Colusa, Glenn, Placer, Sutter and Yolo Counties	Change in location of waterfowl hunting areas	No effect	LTS	LTS	None
	Sacramento-San Joaquin Delta	Decrease in Delta Inflow affecting recreation opportunities	No effect	LTS	LTS	None
	Export Service Area	Change in reservoir water surface elevation affecting fishing and recreation opportunities	No effect	PS, prior to mitigation	PS, prior to mitigation	Yes, see Table ES-4
Flood Control	Upstream from the Delta Region Rivers	Increase in river flows affecting river channel carrying capacity	No effect	LTS	LTS	None
	Project and Non-Project Reservoirs	Change in water surface elevation affecting flood control space	No effect	LTS	LTS	None
		Increase the amount of inflow that could be captured during a flood event	No effect	Beneficial effect	Beneficial effect	None
	Sacramento-San Joaquin Delta	Increase Delta inflows during high water stages	No effect	LTS	LTS	None
	Export Service Area	Change in water surface elevation affecting flood control space	No effect	LTS	LTS	None
		Increase the amount of inflow that could be captured during a flood event	No effect	Beneficial effect	Beneficial effect	None
Power	Project and Non-Project Reservoirs	Change in water surface elevation and reservoir release patterns affecting power generation efficiency	No effect	LTS	LTS	None
		Shift in pumping times to periods of higher electricity costs	No effect	PS, prior to mitigation	PS, prior to mitigation	Yes, see Table ES-4
	Delta Pumping Facilities	Increase in electricity use at project pumps during summer months	No effect	LTS	LTS	None
		Shift in export pumping times to periods of higher electricity costs	No effect	PS, prior to mitigation	PS, prior to mitigation	Yes, see Table ES-4
	San Luis Reservoir	Change in water surface elevation and release patterns affecting power generation	No effect	LTS	LTS	None
		Shift in export pumping times to periods of higher electricity costs	No effect	PS, prior to mitigation	PS, prior to mitigation	Yes, see Table ES-4
	Export Service Area Pumping Facilities	Shift in pumping times to periods of higher electricity costs	No effect	PS, prior to mitigation	PS, prior to mitigation	Yes, see Table ES-4
Cultural Resources	Project and Non-Project Reservoirs	Change in water surface elevation exposing cultural resources to increased cycles of inundation, drawdown and erosion	No effect	Consultation will determine mitigation	Consultation will determine mitigation	Yes, see Table ES-4

Table ES-3
Summary Comparison of Effects of EWA Alternatives

Resources	Area of Analysis	Potential Effects	Effects Determination			Mitigation
			No Action/ No Project Alternative	Flexible Purchase Alternative	Fixed Purchase Alternative	
	Export Service Area Reservoirs	Change in water surface elevation exposing cultural resources to increased cycles of inundation, drawdown and erosion	No effect	LTS	LTS	None
Visual Resources	Upstream from the Delta Region Rivers	Change in river flow affecting the landscape character or overall scenic attractiveness of the area	No effect	LTS	LTS	None
	Project and Non-Project Reservoirs	Decrease in water surface elevation affecting the landscape character or overall scenic attractiveness of the area	No effect	LTS	LTS	None
	Counties with Crop Idling	Temporary conversion of rice land reducing waterfowl viewing opportunities or scenic attractiveness	No effect	LTS	LTS	None
	Sacramento-San Joaquin Delta	Reduce Delta inflows affecting existing visual landscape	No effect	LTS	LTS	None
	Export Service Area Reservoirs	Decrease in water surface elevation affecting the landscape character or overall scenic attractiveness of the area	No effect	LTS	LTS	None
Environmental Justice	Counties with Crop Idling	Disproportionate effect on low-income and minority farmworkers	No effect	No disproportionate effect	No disproportionate effect	None
Indian Trust Assets	Groundwater Basins	Increase groundwater extraction costs or dry out wells on tribes property	No effect	Consultation will determine effects	Consultation will determine effects	See Groundwater

¹Upstream from the Delta Region Rivers include Sacramento, Feather, Yuba, American, Merced and San Joaquin Rivers

²Project and Non-Project Reservoirs include Shasta, Oroville, Folsom, New Bullards Bar, Sly Creek, Little Grass Valley, French Meadows, Hell Hole, and McLure

³Export Service Area Reservoirs include San Luis Reservoir, Castaic Lake, Anderson Reservoir, Lake Perris, Lake Mathews, and Diamond Valley Lake

⁴Counties with crop idling include Butte, Colusa, Glenn, Placer, Sutter, Yolo, Fresno, Kern, Kings, and Tulare Counties

⁵Groundwater basins include Redding, Sacramento, North San Joaquin and South San Joaquin Groundwater Basins

⁶LTS – Less than significant

⁷PS – Potentially significant

⁸SU – Significant unavoidable

Table ES-4
Summary of Mitigation Measures¹ for Potentially Significant Effects of the EWA

Resources	Area of Analysis	Effects Relative to the Baseline Condition	Mitigation Measures	Effects Determination after Mitigation		
				No Action/ No Project Alternative	Flexible Purchase Alternative	Fixed Purchase Alternative
Water Supply and Management	Sacramento-San Joaquin Delta	Change in the rate and timing of Delta inflows and the amount and timing of diversions at the SWP and CVP pumps lowering South Delta water levels	Actions such as installation of temporary pumps or dredging, would reduce effects to South Delta water users. The EWA agencies will pay its share for additional actions needed to increase South Delta water levels to the Baseline Condition.	No effect	LTS	LTS
Water Supply and Management	Sacramento Valley	Decreases in return flows due to crop idling and groundwater substitution could reduce flow of water to down drainage agriculture and other water users	Willing sellers will be required to maintain water levels in drainage systems that do not reduce supplies to downstream users.	No effect	LTS	LTS
Geology, Soils, and Seismicity	Fresno, Kern, Kings, and Tulare Counties	Increase in soil erosion from crop idling	A Dust Suppression Plan, approved by the San Joaquin Valley APCD, must be implemented. Potential elements are: Crop shift (e.g., winter wheat) and harvest between mid June and mid July. The stubble and chaff would be left on the fields to increase surface roughness, vegetative cover, and soil moisture. Increase surface roughness to reduce wind speed at the soil surface so that the wind is less able to move soil particles. Several practices include ripping clay soil, listing and furrowing fields.	No effect	LTS	LTS

Table ES-4
Summary of Mitigation Measures¹ for Potentially Significant Effects of the EWA

Resources	Area of Analysis	Effects Relative to the Baseline Condition	Mitigation Measures	Effects Determination after Mitigation		
				No Action/ No Project Alternative	Flexible Purchase Alternative	Fixed Purchase Alternative
Air Quality	Fresno, Kern, Kings, and Tulare Counties	Increase of fugitive dust and PM ₁₀ emissions from crop idling	A Dust Suppression Plan, approved by the San Joaquin Valley APCD, must be implemented. Potential elements are crop shift (e.g., winter wheat). Harvest winter wheat between mid June and mid July. The stubble and chaff would be left on the fields to reduce the surface area exposed to wind. Increase surface roughness to reduce wind speed at the soil surface so that the wind is less able to move soil particles, which contribute to PM ₁₀ . Several practices include ripping clay soil, listing and furrowing fields.	No effect	LTS	LTS
Air Quality	Sacramento, Yolo, Sutter, Merced, and Yuba Counties	Increased NO _x and PM ₁₀ emissions from older diesel engines in non-attainment areas	EWA agencies will require the use of alternative power including electrical pumps. EWA agencies will encourage the seller to seek off-sets for project-related emissions.	No effect	LTS	LTS
Land Use	Sacramento and San Joaquin Valleys	Land use changes from prime agricultural land to non-prime agricultural land	EWA agencies will minimize the amount of consecutive years a particular parcel is idled	No effect	LTS	LTS
Power	Project and Non-Project Reservoirs	Shift in export pumping times to periods of higher electricity costs	The EWA agencies must develop a financial plan to cover additional costs incurred from implementation of the EWA, including power and ancillary costs.	No effect	LTS	LTS
	Delta Pumping Facilities	Shift in export pumping times to periods of higher electricity costs		No effect	LTS	LTS
	San Luis Reservoir	Shift in export pumping times to periods of higher electricity costs		No effect	LTS	LTS
	Export Service Area Pumping Facilities	Shift in pumping times to periods of higher electricity costs		No effect	LTS	LTS
Cultural Resources	Project and Non-Project Reservoirs	Lowering of water levels in reservoirs exposing previously inundated cultural resources	EWA agencies will consult with the Forest Service and State Historic Preservation Office to determine appropriate mitigation measure to be implemented by the willing seller.	No effect	LTS	LTS

Table ES-4
Summary of Mitigation Measures¹ for Potentially Significant Effects of the EWA

Resources	Area of Analysis	Effects Relative to the Baseline Condition	Mitigation Measures	Effects Determination after Mitigation		
				No Action/ No Project Alternative	Flexible Purchase Alternative	Fixed Purchase Alternative
Recreation	Lake Perris and Castaic Lake	Lowering of reservoir levels earlier in recreation season reducing recreational possibilities	For Lake Perris, EWA agencies with input from officials at Lake Perris will set a limitation on the amount of drawdown. For Castaic Lake, input from recreation officials will be considered.	No effect	LTS	LTS

¹Table ES-4 presents a summary of the mitigation measures. The reader is referred to the respective resource area chapter for details regarding the specific mitigation measure.

Table ES-5
Summary of Beneficial Effects of the EWA Alternatives

Resources	No Action/No Project Alternative	Flexible Purchase Alternative	Fixed Purchase Alternative
Water Supply and Management	No change from existing conditions. ESA would trigger pump reductions to protect fish, and these actions would reduce water supply reliability to Project users.	Water supply replaced due to pump reductions limited to 600 TAF. Fish actions would be taken prior to "take" thresholds. The volume of replacement water would reduce the probability of entering Tier 3 and subsequent uncompensated fish actions.	Water supply replaced due to pump reductions limited to 185 TAF and any carry-over storage. Fish actions would be taken prior to "take" thresholds. If fish actions are not enough to avoid jeopardy, Tier 3 would trigger additional fish actions where contractors may not be compensated
Fisheries and Aquatic Ecosystems	Fishery protection regulatory standards required in NOAA Fisheries and USFWS Biological Opinions, the 1995 Delta WQCP, VAMP and CVPIA would be implemented	Benefits the recovery of at-risk fish species by making available 600 TAF of EWA assets for fish actions. Fish actions could include closing DCC gates, increasing instream flows, and augmenting Delta outflows to improve spawning and rearing habitat and migration.	Contributes to the recovery of at-risk fish species by making available 35 TAF of EWA assets for fish actions. Fish actions taken would be limited by available assets and EWA agencies would need to prioritize fish actions. In most years, total assets available would be used for pumping reduction and repayments
Fisheries and Aquatic Ecosystems	No effect	Delta outflows during spring provide benefits to migratory and Delta fish populations (habitat); outflows during summer and fall benefit migratory fish.	Delta outflows during spring limited to 35 TAF acre-feet upstream purchase
Regional and Agricultural Socioeconomics	No effect	Sale of water to EWA would increase net revenues to farmers/landowners	Sale of water to EWA would increase net revenues to farmers/landowners
Flood Control	No effect	Additional space made available from release of stored water would provide space for flood control	Additional space made available from release of stored water would provide space for flood control
	No effect	Metropolitan WD use of flexible storage would provide additional storage space for inflow from the California Aqueduct or local streams	Metropolitan WD use of flexible storage would provide additional storage space for inflow from the California Aqueduct or local streams